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The Steelfoundry Productivity Team

Yesterday, a team representing a cross-section of the steelfoundry industry sailed for America under the leadership of Mr. F. A. Martin, president of the British Steel Founders' Association and managing director of the Osborn Foundry & Engineering Company, Limited, of Sheffield. It is the first team to leave this country under the auspices of the Anglo-American Council on Productivity, and this fact has given to the event very wide publicity. The rapidity with which the tour has been organised is due to the long-established co-operation between the firms engaged in the making of steel castings. Additionally, the trade unions associated with the industry have been extremely helpful in the selection of the team. If at any time we had doubts as to the need for the exchange of information, they were dispelled during a recent conversation with a moulder who had helped in the making of some of the largest castings ever made in this country. He protested that with such a background of success in the production of large castings, we had nothing to learn from the Americans. Our forthright reply was, if such jobs had been carried out across the Atlantic, the highest grade of photographic records of the job would be available for posterity to see. This is but one angle, but it is significant.

We were just a little perturbed because the established precedent that the teams should be made familiar with current practice in this country before sailing, by means of an organised tour of British works, had not in this case because of urgency been undertaken. However, we were assured by Mr. Martin that, due to the "ever-open-door" policy of the steelfounders, knowledge of the various techniques used by the industry was widespread. All steelfounders had for a decade been welcome guests in the shops of the concerns engaged in the manufacture of steel castings. The American steelfounders have followed a similar policy and this fact will be helpful in establishing initially a feeling of comradeship between hosts and guests. We look forward to the time when the guests will turn hosts, for it is reasonable to assert that the British steelfounding industry has, like its American counterpart, much well-developed technique to show.

It was a very nice gesture of the British Steel Founders' Association to offer a farewell dinner on the eve of sailing to the team, their wives, leading members of the staff of the Productivity Council, and the trade union officials concerned. Mr. F. W. Rowe presided and amongst those who expressed their good wishes were Sir Frederick Bain, Sir William Lawther, and Mr. J. Gardner, the last of whom ascribed the choice of the steelfounders to be the first team to visit America to the reliability of the personnel of the industry. In the words of the modern youth, "We couldn't agree more," for if any characteristic is necessary in the production of a good steel casting, it is reliability. Furthermore, Mr. Martin has emphasised that every member of the team has promised to be truthful in his account of the visit. A combination of these two attributes should produce a report of great value to the Anglo-American steelfoundry industry.

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The Factory Report

Foundrymen will scrutinise the 1947 Factory Report* with somewhat mixed feelings. With a largely expanded working force the number of fatal and non-fatal accidents has been reduced from 31 and 13,194 in 1946 to 27 and 12,884 in 1947. On the other hand, "iron and steel founding" shows the highest accident frequency rate (3.75) amongst the 28 industries investigated, the average being 2.75. This "frequency rate" is the number of lost time accidents per 100,000 man-hours worked. The chief inspector, Mr. G. P. Barnett, in this, his second report, expresses himself quite sympathetically with managements who wish to improve working conditions, but are prevented by the plethora of restrictions imposed by other Government departments and, moreover, he is concerned with the present high cost of the whitewashing of walls. Referring to some of these difficulties in his opening paragraph, Mr. Barnett states:—". . . there has been progress and it is pleasing to learn, for example, what a great change has been effected in many potteries, cotton mills and ironfoundries compared with the conditions obtaining 20 or 30 years ago. Managements no longer need convincing that good, healthy and safe conditions, coupled with a proper appreciation of the human factor, are a great incentive to the recruitment of labour."

Using Shavian technique, this " pat on the back " is followed by the usual " kick in the pants," couched in these words:—" The Report of the Joint Advisory Committee on Ironfoundries was published during the year and, although some of the more progressive firms had anticipated the Committee's findings, inspectors were, in general, disappointed with the rate of progress up to the end of 1947, particularly in the smaller foundries, and all are of the opinion that, generally speaking, the conditions in foundries attached to engineering works are better than those cases where foundry work is the only process carried on." The Shavian technique is maintained by awarding full marks for four foundry installations, a lengthy description being given of each one.

From the industrial diseases section of the Report we learn that, owing to the raising of the school-leaving age, there were 37,243 fewer boys entering industry in 1947. The rejection of young persons as being unsuited for industry includes as the chief factor, pediculosis or body lice. This section also reports under " Deaths from fibrosis of the lung, including silicosis, etc.," that the incidence amongst " steel dressers " during the period 1940 to 1947 was 4, 9, 9, 4, 10, 5, 22 and 13. The use of colour in factories comes in for favourable comment. We think we have been a little too precipitate in the adverse comments we have made on colours in foundries. The lasting benefits to be gained on functional grounds outweigh in importance the fleeting impression of " dirty finery." This Report, too, has burnished-up itself somewhat by the inclusion of a number of graphs, though it is an innovation which does not appeal to us. We feel that if the time interval between the period under review and publication were materially reduced, there would be increased interest in what is for all factory managements a document of paramount importance.

* Annual Report of the Chief Inspector of Factories for the Year 1947. Published by H.M. Stationery Office. Price 2s. 6d. net.

Forthcoming Events

(Secretaries are invited to send in notices of meetings, etc., for inclusion in this column.)

MARCH 14.

Institute of British Foundrymen

Sheffield Branch:—" Refractory Materials in the Foundry Industry," by A. T. Green and Dr. G. A. Rigby, at the Royal Victoria Hotel, Sheffield, at 7.30 p.m.

The Institute of Metals.

Scottish Local Section:—" Some Thoughts on Organisation, Economics and Good Housekeeping in Non-ferrous Jobbing Foundries," by G. Skript, M.I.Mech.E., F.I.M., at the Institution of Engineers and Shipbuilders in Scotland, 39, Elmbank Crescent, Glasgow, at 6.30 p.m.

MARCH 16.

Royal Statistical Society—Industrial Applications Section.

North-Eastern Section:—" The Integration of Elementary and More Advanced Statistical Methods in the Control of Processes," by W. J. Jennett, at the Newcastle Chemical Industries Club, 18, Lovain Place, Newcastle-upon-Tyne, at 6.30 p.m.

MARCH 18.

Institution of Works Managers.

Manchester Branch:—" A Proposed Code of Management," by W. D. B. Brown, at the Engineers' Club, Albert Square, Manchester, at 6.30.

Institution of Production Engineers.

North-Western Graduate Section:—" Grinding," by J. Stanniers, at Neville Hall, Newcastle-upon-Tyne, at 6.30 p.m.

Institute of British Foundrymen.

Falkirk Section:—Annual Business Meeting in the Smoke Room of the Temperance Café, Lint Riggs, Falkirk, at 7.0 p.m.

MARCH 19.

Bristol Branch:—Short Paper Prize Scheme, at the Grand Hotel, Bristol, at 3.0 p.m.

Institution of Production Engineers

Yorkshire Section:—Annual Dinner at the Hotel Metropole, Leeds, at 6.30 for 7.0 p.m.

THE SWISS INDUSTRIES FAIR is to be held at Basle from from May 7 to 17, 1949.

" ADHESIVES FOR INDUSTRY " is the title of a four-page pamphlet issued by Aero Research, Limited, Duxford, near Cambridge, which should be of particular interest to patternmakers. In it are detailed ranges of synthetic resin adhesives suitable for assembly gluing, for plywood and veneering and for metal bonding.

Synthetic Resin Core Binders*

A Wide Survey of Potentialities

By G. L. Harbach, A.I.M.

The President of the London Branch, introducing Mr. Harbach, said he represented one of the pinnacles on the technical side of the Institute's work and was a prolific writer of Papers on development and research in the foundry. Apart from serving on several I.B.F. and B.C.I.R.A. Committees in connection with the properties of cast iron and on education in the foundry industry, he was a member of a Sub-Committee of the Joint Standing Committee on Conditions in Iron-foundries and a member of the Technical Committee of the Association of Bronze and Brass Founders. The two latter committees had sponsored the work, a report of which formed the basis of the Paper.

The President added that the members of the London Branch were proud to welcome him. Mr. Harbach then presented his Paper:—

Foreword

This Paper is a report on an investigation, sponsored by the Joint Standing Committee on Conditions in Iron-foundries and the Technical Committee of the Association of Bronze and Brass Founders, into the properties of synthetic resins as potential core binders.

Introduction

Linseed oil has been the main constituent of oil core binders since their introduction about 40 years ago, and the ever-increasing popularity of oil binders is proof of their technical ability to produce cores to meet foundry requirements. Nevertheless, the present high cost and scarcity of linseed oil provides an incentive to search for alternative materials. Furthermore, as pointed out in the "Garrett Report," [1] the fumes from oil-bonded cores when casting is being carried out are disagreeable and irritating, and if these could be minimised or eliminated, it would do much to improve foundry conditions.

Much has been heard during recent years of the wide range of properties and expanding uses of plastics, and it appeared that the property of certain synthetic resins to harden at about 150 deg. C. and to disintegrate at somewhat higher temperatures might indicate their suitability as alternatives to linseed oil in the field of core binders. Moreover, there were other attractive possibilities:—(1) Dollar saving, as the raw materials are home produced; (2) fuel saving due to the lower baking temperature required; (3) time and fuel saving, as the hardening process requires no period for oxidation; (4) further time saving by the use of di-electric heating, whereby a core may be baked in a few minutes or even seconds, and (5) the possibility of eliminating or minimising objectionable fumes.

When the idea of using synthetic resins as core binders arose some two years ago, little or nothing had appeared in the foundry Press and the materials were in such short supply that only experimental quantities were available. Since then, articles, originating mainly from U.S.A., have described their use as core binders during the war, and they have been adopted to some extent in this country and on the Continent, chiefly in light-metal foundries; in addition, the supply position is improving and the British manufacturers are alive to the possibilities in all branches of foundry work, as evidenced by the Papers and discussions at the British Iron and Steel Research Association Conference on Core Binders held during October, 1948.[2]

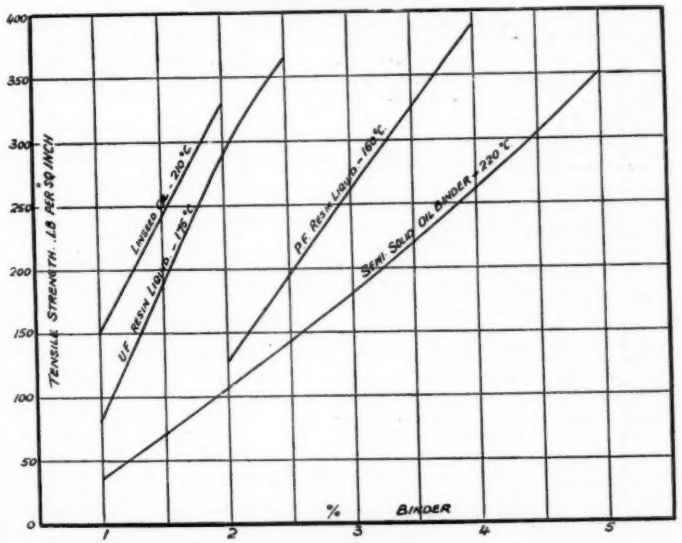


FIG. 1.—DRIED STRENGTH OF CORES WITH OIL AND SYNTHETIC RESIN BINDERS AND SOUTHPORT SILICA SAND. ALL BAKED FOR ONE HOUR AT THE TEMPERATURE SHOWN.

* A Paper read before the London Branch of the Institute of British Foundrymen, Mr. P. D. Pincott presiding, the Author is Chief Metallurgist, Worthington-Simpson, Limited.

Synthetic Resin Core Binders

Properties Desired in a Core Sand

The properties of present-day oil core binders are taken for granted and, being commonplace, they are rarely assessed except by rule of thumb. Nevertheless, they provide the standard by which alternatives are judged, and the following somewhat elementary survey of the properties of cores and core binders was compiled as a preliminary to the investigation envisaged.

Cores are used to form the internal shapes of castings, and are therefore frequently almost surrounded by metal; as a consequence two essential requirements are: a high permeability to aid the escape of gas when the mould is poured and rapid collapse after the metal solidifies, so as to permit metal contraction and to assist fettling. For these reasons silica sands are most commonly employed as, due to their grains being of uniform size, the maximum permeability is obtained for any given average grain size and the absence of clay promotes disintegration. The other properties are provided by the core binder and the following summarises them in the order met with in core-making practice, some being essential, others desirable, but the majority are present in some degree in the core sands bonded by the linseed-oil type of binders:—(1) Ease of mixing the binder with the sand; (2) flowability and non-stickiness during core making; (3) green strength and air-drying properties to retain correct shape before baking; (4) adequate "life" of the mixed sand—it must not air dry so rapidly as quickly to become unusable; (5) baking conditions not too critical for foundry operation; (6) moisture resistance after baking; (7) dry strength and non-friability to withstand fairly rough usage in the foundry and to resist the action and pressure of the metal when the mould is poured; (8) low gas content and freedom from obnoxious fumes during and after pouring; (9) collapsibility after casting to permit metal contraction and to provide good knock-out properties; (10) good surface finish. All the above have been considered in this investigation, the more important points, Nos. 5 to 10, having been assessed experimentally and the remainder noted as incidental during the progress of the work.

Materials Used

The synthetic resins most commonly employed as core binders are urea formaldehyde (U.F. resin) and phenol formaldehyde (P.F. resin). In the makers' view, this statement is about as vague as a reference to ferrous and non-ferrous metals in the foundry industry; nevertheless, all the samples tried, except one, belonged to one of these groups and from the standpoint of core binding, each has distinctive properties. The exception is melamine formaldehyde, which is similar to, and has certain advantages over, U.F. resin, but has the disadvantage of being much higher in price.

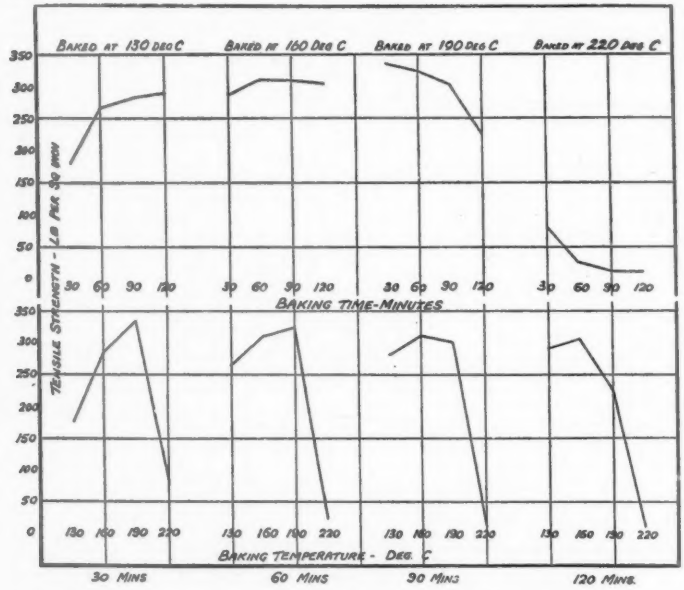


FIG. 2.—GRAPHS OF TEMPERATURE AND BAKING TIME FOR A 2 PER CENT. U.F. RESIN CORE SAND, USING SOUTHPORT SILICA AS THE BASE SAND.

Both U.F. and P.F. resins are available in aqueous solutions and as powders. The former being cheaper and more readily employed, the results reported were obtained from solutions, the resin content being approximately 50 per cent. in each case. For comparative purposes, similar tests were carried out with linseed oil and a semi-solid binder, Southport silica sand being used throughout, except in the gas determinations, when clay-free Ryarsh sand was used.

Dried Strength

The most important property to determine was the capacity of the resins to develop strength and hardness when mixed with silica sand and baked. Fig. 1 shows the comparative results obtained from various proportions of the two ordinary binders and the two synthetic resins, designed to produce a range of dried strengths extending above and below normal practical limits. The curves show that to obtain a satisfactory working strength of around 250 lb. per sq. in. tensile the proportions of binders required were:—Linseed

oil, 1.5 per cent.; semi-solid, 4 per cent.; U.F. resin liquid, 1.8 per cent. (0.9 per cent. actual resin), and P.F. resin liquid, 3 per cent. (1.5 per cent. actual resin). Below 250 lb. per sq. in. it was noted that linseed oil produced the hardest core, semi-solid and P.F. resin were not quite so hard and U.F. resin cores tended to be friable at the edges.

Assuming that prices were competitive and other technical properties adequate, it was obvious from these early experiments that the new materials showed promise as core binders.

Baking Time and Temperature

From a production standpoint, the need for closely-controlled baking conditions might prove an obstacle in the use of synthetic resins; therefore, to determine the best range for the production of satisfactory cores and to find the times and temperatures which caused under- or over-baking, a standard method of testing was applied to each binder. Using mixtures of 2 per cent. linseed oil, 4 per cent. semi-solid, 2 per cent. U.F. resin liquid and 3 per cent. P.F. resin liquid, to give approximately 250 lb. per sq. in. tensile strength when dried, tensile test cores were baked for 30, 60, 90 and 120 min. over a range of temperatures of about 100 deg. C., thus including all the desired conditions and obtaining the different results required.

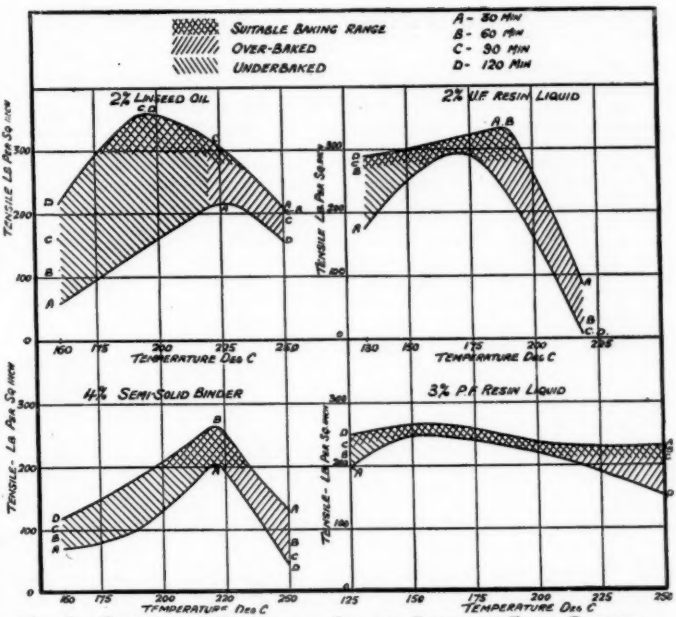


FIG. 3.—COMPARISON GRAPH FOR OIL AND SYNTHETIC RESIN BINDERS. CORE TENSILE STRENGTH AFTER BAKING FROM 30 TO 120 MIN. AT VARIOUS TEMPERATURES.

TABLE I.—*Effect of Baking Times and Temperatures on Sand Mixtures with Two Oil and Two Synthetic-Resin Binders. (Tensile Strength in Lb. per Sq. In.)*

	Baking time, minutes.	Baking temperatures, deg. C.				
		130.	160.	190.	220.	250.
2 per cent. linseed oil	30	—	60	125	215	210
	60	—	110	270	305	208
	90	—	160	352	325	195
	120	—	215	352	255	160
4 per cent. semi-solid	30	—	70	80	205	130
	60	—	80	145	265	75
	90	—	95	178	230	55
	120	—	120	180	235	40
2 per cent. U.F. resin liquid	30	175	285	335	80	—
	60	265	310	325	25	—
	90	280	310	300	10	—
	120	290	305	225	10	—

	Baking time, minutes.	Baking temperatures, deg. C.					
		125.	150.	175.	200.	225.	250.
3 per cent. P.F. resin liquid	30	205	262	245	235	230	230
	60	215	265	248	230	210	225
	90	225	260	255	225	215	210
	120	250	255	240	225	190	153

Dealing with U.F. resin as an example, Fig. 2 illustrates the various tensile strengths obtained; the top four curves plotted against time show that baking was satisfactory at all temperatures from 130 to 190 deg. C. for all periods of time except 30 min. at the lower temperature and 120 min. at the higher temperature, whilst at 220 deg. C. serious breakdown occurred even after only 30 min. baking. The four bottom curves are the same values plotted against temperature, and if these be superimposed on each other with the outer points joined, an area is obtained in which the depth at any given temperature indicates the effect of baking time; the low tensile strengths at both ends show the effect of under- or over-baking due to time and temperature. This method of combining each series of results has been used to simplify comparison of the four binders under examination, the grouped results being shown in Fig. 3 and the individual results recorded in Table I. Consideration in detail is unnecessary, but the following features deserve comment from the foundry viewpoint:—

(1) Oil binders, especially linseed oil alone, required more than 30 min. baking to develop full strength,

Synthetic Resin Core Binders

whereas the resins baked completely in that time when the temperature was suitable.

(2) Synthetic resins, particularly P.F., baked satisfactorily over a wider range and at lower temperatures than oil binders.

(3) U.F. resin broke down at lower temperatures than either of the oil binders or P.F. resin, a property which explains its popularity in light-metal foundries.

From these experiments, using dried strength as a criterion, synthetic-resin core binders have indicated that they offer encouraging possibilities of fuel saving, increased output from ovens (due to shorter baking time) and greater flexibility in baking temperatures than with oil binders.

Gas Evolved from Oil and Resin Binders

The need for high permeability in core sands to aid escape of gas has already been mentioned; it follows from this that core binders of high gas content are undesirable. After testing for dried strength, estimations were made of the quantities and rates of evolution of gas given off at 960 deg. C. from the same four core mixtures baked at various temperatures (except that washed Ryarsh sand was used to avoid the variable "blank" present in Southport sand). Since cereals are commonly used as additions to synthetic-resin binders, 1 per cent. dextrin was added to the linseed oil and resin mixtures and samples of each of the new mixtures were included in the gas determination experiments. The apparatus and method employed were similar to those recommended by the Institute of British Foundrymen Sub-committee T.S.13[3]—10-grm. samples were used, readings were taken at 5-sec. intervals and calculated to mls. at N.T.P. per grm. of core. In most cases the gas evolution was complete in 100 secs. or less. The total quantities of gas produced are listed in Table II.

The results show that P.F. resin alone has the lowest gas content of the series, with little variation in quantity over the full baking range; U.F. resin alone is 60 to 70 per cent. higher and is similar to the 4 per cent. semi-solid when baked within the practical temperature limits of both binders. It is worthy of note that both oil-bonded samples baked at 190 deg. C.—not unknown in commercial practice—yielded approximately one-third more gas than when correctly baked at 220 deg. C., whereas some earlier tests (results presented at the B.I.S.R.A. Conference[2]) indicated that baking at 130 deg. C. instead of 170 deg. C. had little effect on the gas content of the resin-bonded cores. The results of the dextrin additions were somewhat surprising, for, when mixed with linseed oil and P.F. resin, substantial increases occurred as expected, but with the U.F. resin dextrin appeared to have much less effect. There may be produced a combination of dextrin with U.F. resin which does not occur with the P.F. type, and the results of dextrin additions may differ from other cereal binders frequently used in synthetic-resin core mixtures.

TABLE II.—*Total Gas Evolved at 960 deg. C. from Cores Made with Various Binders Baked at Different Temperatures. Results Expressed in mls. at N.T.P. per gram of Core.*

Binder.	Baking temperature, deg. C.			
	170.	190.	220.	250.
2 per cent. linseed oil	12.1	11.7	8.6*	6.1
4 per cent. semi-solid	15.5	14.6	10.7*	7.2
2 per cent. U.F. resin liquid ..	11.6*	11.0	9.8	4.5
3 per cent. P.F. resin liquid ..	6.8*	6.6*	6.5*	6.4
2 per cent. L. oil + 1 per cent. dextrin	14.7	13.9	12.4*	8.5
2 per cent. U.F. resin + 1 per cent. dextrin	13.5*	13.3*	12.2	7.1
3 per cent. P.F. resin + 1 per cent. dextrin	11.0*	10.4*	9.5	7.7

* Baked at correct temperatures

Rate of Gas Evolution

The total gas evolved is probably less important than the *rate* of evolution, especially during the period of pouring and solidification of the casting; Table III and

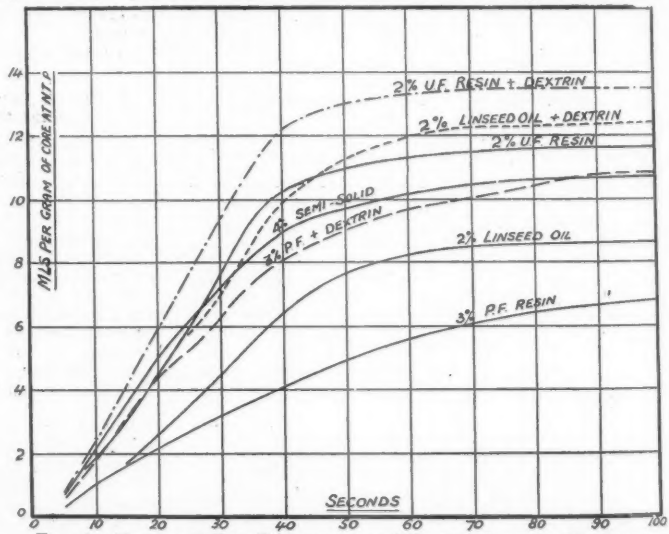


FIG. 4.—RATES OF GAS EVOLUTION AT 960 DEG. C. FROM CORRECTLY BAKED CORES BONDED WITH VARIOUS MATERIALS.

TABLE III.—*Rate of Gas Evolution at 960 Deg. C. from Cores Made With Various Binders Baked at Appropriate Temperatures, viz., Oil and Semi-Solid at 220 deg. C., and Resins at 170 deg. C. Results Expressed in mls. at N.T.P. per gram of Core.*

Binder.	Seconds.									
	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.
2 per cent. linseed oil	1.1	2.6	4.4	6.4	7.7	8.2	8.5	8.6	8.6	8.6
4 per cent. semi-solid	2.2	4.9	6.7	9.0	9.7	10.2	10.5	10.6	10.7	10.7
2 per cent. U.F. resin liquid	1.6	4.3	7.5	9.7	10.6	11.1	11.4	11.5	11.6	11.6
3 per cent. resin liquid	1.1	2.2	3.2	4.0	4.8	5.7	6.1	6.5	6.7	6.8
2 per cent. L. oil + 1 per cent. dextrin ..	1.7	4.5	7.0	9.9	11.3	11.9	12.3	12.3	12.4	12.4
2 per cent. U.F. resin + 1 per cent. dextrin ..	2.5	6.0	9.3	12.2	13.0	13.3	13.5	13.5	13.5	13.5
3 per cent. P.F. resin + 1 per cent. dextrin ..	1.6	4.2	6.3	8.1	9.0	9.6	10.1	10.5	10·7	10.9

Fig. 4 are therefore included to show the respective rates of gas production from the seven binders tested, all after baking the cores at the correct temperatures. Without dextrin additions, U.F. resin and semi-solid have roughly equal rates for the first 25 secs. and rather more than double that of the P.F. resin, linseed oil being close to P.F. resin at that stage and later taking up a position midway between the two resins. The additions of one per cent. dextrin to P.F. resin and linseed-oil core mixtures raises the rate and quantity of gas evolved to approximately the same figures as those when semi-solid is used, but such an addition affects U.F. resin-bonded cores to a lesser degree. Assessing the gas-evolution results from a practical standpoint, synthetic resins are unlikely to cause difficulties if used in place of semi-solid binders. Where gas evolution is a problem, P.F. resin would show advantages, assuming little or no cereal were included in the mixture.

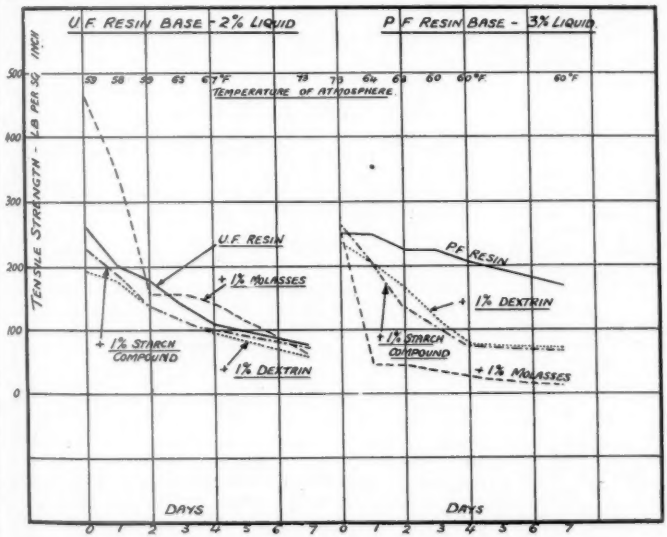


FIG. 5.—EFFECT OF MOISTURE ABSORPTION ON CORE STRENGTH. CORES TESTED AFTER STANDING IN A SATURATED ATMOSPHERE FOR VARYING PERIODS.

Effects of Moisture Absorption

Resistance to absorption of moisture is important when cores have to be stored after baking or used in green-sand moulds; tests were therefore devised to determine the effects of a humid atmosphere on resin mixtures (including those with melamine resin, which is similar to the U.F. type, but has greater resistance to moisture) and a 2 per cent. oil mixture, the latter to provide a basis for comparison. Although synthetic-resin liquids alone are capable of developing a "green" bond strength with silica sands, other additions to improve the properties in the green state are likely to be used in production; for this reason the tests for moisture resistance included the separate additions of 1 per cent. each in turn of starch compound, dextrin and molasses to each of the resins and the linseed-oil mixtures.

A batch of 20 tensile test cores were made from each mixture and baked at the correct temperatures for 1 hr. After cooling, a pair were tested and the remainder were placed in a closed glass vessel containing water so as to provide an atmosphere of 100 per cent. relative humidity. A further pair was tested each day for a week (except for the week-end). On the seventh day, the broken test-pieces were used to determine the total moisture absorbed by each mixture and an unbroken pair, after re-baking at 110 deg. C. for 1 hr., was tested to ascertain the strength recovered. The results of the tests are recorded in Table IV, and Fig. 5 depicts the results of the U.F. and P.F. resin groups in graphical form for ease of comparison. Consideration of the notes made during this investigation showed that strength was not an adequate measure of fitness for foundry use; the satisfactory "feel" of some cores belied the low-strength figures; others of reasonable strength would have been condemned. The most striking example was the U.F. resin and molasses core mixture, which was usable on the seventh day despite the low strength, whereas all the other U.F. mixtures,

Synthetic Resin Core Binders

although much stronger, were, on the third day, too friable for use. A core-hardness tester would have given numerical results of more practical value, but, unfortunately, no suitable instrument was available when the tests were carried out. A further disappointing feature was that, although it had been anticipated that by providing 100 per cent. relative humidity, the conditions would be constant and the results strictly comparable, it was found that warm days accelerated the strength loss—an effect opposite to that operating under foundry conditions. This was most noticeable in the linseed-oil series on the second and third day, when the temperature rose from 54 to 63 deg. F. It is probable that shop tests would give results of greater reliability from the practical standpoint; nevertheless, a few general conclusions can be drawn from the observations made and the results obtained.

Judging from the viewpoint of service behaviour as cores, rather than that of dried strength retained after one week in a humid atmosphere, the order of superiority of the groups was: linseed oil, P.F. resin (except with molasses), melamine resin and U.F. resin. In contrast to its use with P.F. resin, the molasses addition to melamine and U.F. resin not only produced cores which were initially of high strength and hardness, but also were still usable on the seventh day despite the serious loss in strength. In practically every case re-baking for 1 hr. at 110 deg. C. reproduced a serviceable core.

TABLE IV.—*Effect on Various Cores of Standing in an Atmosphere Saturated with Water Vapour.*

Binder.	Tensile strength, lb. per sq. in. No. of days standing. 0.	1.	2.	3.	4.	7.	7A*.	Moisture, per cent.†	Remarks on cores.
2 per cent. linseed oil alone	331	312	305	261	259	222	332	0.083	Hard throughout.
Ditto with 1 per cent. starch compound	178	162	168	119	115	96	221	0·256	Hard until the fourth day, slightly friable by the seventh day, but still usable.
Ditto with 1 per cent. dextrin	177	173	162	100	78	67	212	0.228	
Ditto with 1 per cent. molasses	265	205	135	87	72	63	245	0.256	
Room temperature, deg. F.	54	56	54	63	59	59	—	—	—
2 per cent. U F. resin liquid alone	260	201	174	137	108	57	240	0.165	Slightly friable on the first day, unusable after the third day.
Ditto with 1 per cent. starch compound	225	185	135	111	99	71	198	0.310	
Ditto with 1 per cent. dextrin	190	175	135	112	95	57	187	0.265	
Ditto with 1 per cent. molasses	467	353	152	152	142	55	253	0.276	Fairly hard and usable after the seventh day.
Room temperature, deg. F.	59	58	59	65	67	73	—	—	—
3 per cent. P.F. resin liquid alone	247	247	225	223	202	166	205	0.082	Hard throughout.
Ditto with 1 per cent. starch compound	265	200	135	101	75	68	141	0.195	Hard up to the fourth day. Of doubtful use after the seventh day.
Ditto with 1 per cent. dextrin	235	199	165	111	78	67	205	0.190	
Ditto with 1 per cent. molasses	256	45	49	34	29	24	186	0.271	Hard as baked. Useless after the first day.
Room temperature, deg. F.	73	64	63	60	60	60	—	—	—
1.5 per cent. melamine powder alone	344	319	299	300	270	249	306	0.139	Hard throughout.
Ditto with 1 per cent. starch compound	139	138	120	77	77	55	98	0.243	Rather friable after the first and useless after the third day.
Ditto with 1 per cent. dextrin	244	223	160	154	145	143	195	0.215	Fairly hard and usable after the seventh day.
Ditto with 1 per cent. molasses	447	204	98	57	50	47	120	0.250	
Room temperature, deg. F.	60	65	60	59	59	59	—	—	—

* Dried for one hour at 110 deg. C. after seven days' exposure. † After seven days' exposure.

On the whole, it appears that moisture absorption would not condemn synthetic resins for use as core binders, although they might prove inferior to linseed-oil bonded cores if allowed to stand in a damp atmosphere and used without re-baking.

REFERENCES.

1 Report of the Joint Advisory Committee on Conditions in Iron Foundries.
2 B.I.S.R.A.: Summary of the Proceedings of the Conference on Foundry Core-bonding Agents.
3 I.B.F. *Proceedings*, 1945-46, page A192.

(*To be continued*)

House Organs

Rope Talks No. 21. Published by British Ropes, Limited, Carr Hill, Doncaster. There are but few illustrated magazines which maintain the interest of the reader from cover to cover better than this house organ. It is devoid of internal gossip or of obvious commercial advertisement, yet because of its inherently good make-up and the excellent presentation of its articles it is good publicity for ropes. The subjects covered include the rebuilding of the House of Commons, the "Pamir," the salvaging of the "Matrona," and Underground Reservoirs.

The Nickel Bulletin, December. This issue, which completes Volume 21, 1948, contains the complete index of subject matter for the year, published under the headings of Subject, Author and Patents. Abstracts cover applications of nickel-containing materials in reference to chemical and railway engineering, the electrical, petroleum and motor industries, paper mills, and sewage plants. Copies are obtainable, free of charge, on application to The Mond Nickel Co. Ltd., Sunderland House, Curzon Street, London, W.1.

Notes from the Branches

Newcastle-upon-Tyne

At the meeting held in January in the Neville Hall, the Branch President, Mr. S. Unsworth, had the pleasant duty of introducing the President of the Institute, Mr. R. B. Templeton, M.I.Mech.E., and the secretary, Mr. T. Makemson, M.B.E., who were present at his invitation. Mr. Unsworth extolled their personalities and the great work both had done and were doing in the furtherance of the interests of the Institute.

Responsibility for Training

MR. TEMPLETON, in a short address, expressed his high appreciation of the warm welcome they had received. It was a pleasure to come around the branches and speak to their members and also to hear the members' comments on the way the Institute was being run. It was refreshing to be able to say what we thought and still maintain the friendly atmosphere of the Institute. Apprentice training was the most vital thing with which they were concerned to-day. The manufacturers' associations should take an active interest in the training schools. He referred to what had been done at Swan Village, which was proving most successful in spite of the initial difficulties, and he advocated that other regions should follow the Midland example by starting at once with the formation of training centres. If no such movement were made, we should have no new blood in the industry. The Institute would give every help. He was convinced that it was the function of employers to support this movement by action.

He paid a tribute to the Newcastle branch which was one of the oldest, and one in which a large proportion of the members were employed on the production side of the industry.

MR. UNSWORTH, before calling on Mr. Makemson, said that the question of a foundry training school was under consideration by the Branch Council. Mr. C. R. Tottle, B.Met., A.I.M., of the Department of Metallurgy, King's College, had suggested that the branch members might visit the department, and particularly student members.

New Status of Members

MR. MAKEMSON said that he had known the Newcastle Branch for a very long time, and he felt that in some respects it was on a sounder basis and now had a more promising future than at any part of its history. He referred to the new Bye-Laws which had just come into operation following the granting to the Institute of a Supplementary Charter, under which those new Bye-Laws were made. The principal alteration concerned the basis of admission to membership; whereas admission to the various grades was previously based on the description of a candidate's occupation, in future it would be on the basis of his experience, his technical knowledge and his general standard of attainment in the industry. This new procedure would have the effect of raising the standard of members and at the same time it would mean that membership itself would be a professional qualification.

In recent years the Institute had increased its activities and its ramifications considerably, mainly in the direction of increased work of a centralised character. It was necessary, however, not to lose sight of the fact that the fundamental activity of the Institute consisted of the work of the Branches. It was through the Branches that the great majority of the members made their principal and in many cases their only contact with it. The Institute was not suspended from the top, it was supported from below, and he hoped that those in charge of the Institute's affairs would never lose sight of that fact.

He referred to certain increased revenue which the Institute hoped to receive through the Joint Iron Council to assist in educational and special research work. Such work would be supplementary and additional to the Institute's present activities which would continue to be financed from the members' subscriptions.

MR. UNSWORTH pressed for more frequent visits from officials of the Institute to promote the personal touch. He assured the Institute that the Newcastle Branch would support the General Council in any action it might take. He mentioned that at Newcastle they were already considering the formation of a library.

Manufacture of Cast Crankshafts

MR. TEMPLETON then showed a series of lantern slides of the various phases of making a three-throw cast-iron crankshaft, and commented on the various methods of moulding and the precautions taken to ensure a perfect casting. This was followed by a film showing the details of manufacture of a cast-iron crankshaft from start to finish.

The PRESIDENT then opened the meeting for discussion.

MR. LASHLY asked if any special precautions were taken to prevent dirt from lodging in the mould—there were so many projections. He also requested an explanation of the great difference between the weights of the cast-iron crankshaft and the forged steel crankshaft.

MR. TEMPLETON explained that it was not a very difficult casting to make, though, of course, they had to take special precautions against slag entering the mould. As to the difference in weight, it must be remembered there was a large amount of machining necessary with the forging.

Answering a question from MR. W. D. HARRISON, MR. TEMPLETON said there was an annealing treatment after casting and before machining. The shaft was heated to 500 to 600 deg. C., and then cooled in the furnace. By this treatment 50 to 75 per cent. of the remaining stresses were eliminated. The temperature and time were, of course, varied according to the mass and section of the metal.

Applications and Metal Composition

MR. N. CHARLTON asked if they had made crankshafts for small engines and automobile engines.

MR. TEMPLETON pointed out that the shaft portrayed in the film was for a constant-speed engine. They had made a large number of crankshafts for land-type Diesel

Notes from the Branches—Newcastle

engines running at 2,400 r.p.m.; and, answering Mr. H. Smith, he said they had had no experience of cast-iron crankshafts for marine propulsion engines. Where quantities of three- or six-throw shafts came into the picture, they had to go into the question of costs, as it would be no use trying to sell if they were not competitive. Admittedly, the cast-iron crankshaft had not the additional strength of the forged-steel shaft, but there were other factors to consider, such as the damping effect with the cast-iron shaft.

On the question of composition, Mr. Templeton said a general average would be C 2.9, Si 1.2, Mn 0.6 to 0.7 per cent., and S and P as low as possible. Dependent on the dimensions of the shaft, certain alloys, such as copper, nickel and molybdenum, would be added.

In closing the meeting, the BRANCH-PRESIDENT considered that the lecture they had heard was just what they liked; it was one of the most interesting presented to them. In according their visitors a hearty vote of thanks, he invited them in the name of the branch to pay another visit.

London—Slough Section

A meeting of the Slough Section of the London Branch of the Institute, with Mr. F. C. Evans in the chair, last week was devoted to a discussion of questions put forward by members. The first of these, regarding proposed standardisation of moulding boxes and pins, was ably dealt with by Mr. A. Logan, who outlined the development which had taken place since the matter was first brought up at last year's discussion meeting. He stated that partly as a result of the initiative of the Slough Section there was now being formed a sub-committee of the Technical Council of the Institute charged with the business of formulating, in consultation with other interested bodies (chiefly manufacturers of moulding boxes and machines) detailed proposals for such standardisation.

A second question concerned sizes of runners, downgates and ingates for high-strength cast-iron castings. Here some of the limiting factors were outlined by Mr. A. R. Parkes, while Mr. F. C. Evans, Mr. E. Raybould (hon. secretary) and other speakers emphasised *inter alia* the suitability of pencil drop-gates for plain cylindrical castings, and the value of film records for showing what happened in running a mould. Then followed questions on alternative melting methods for aluminium; on refractories for high temperatures, and on the adoption of the standard pattern colours. A lively and informative discussion developed and the success of this type of meeting was again voiced at its close.

MR. C. T. MONSEUR, head of the well-known foundry equipment and supply firm of Liége, Belgium, has been involved in a motor-car accident and is seriously ill with head injuries, broken ribs and leg. His many friends in England can write to him at his home address, 129, rue de Campine, Liége, Belgium.

Fuel in the Foundry

The British Cast Iron Research Association is organising a conference at Ashorne Hill, Leamington Spa, from April 7 to 9, on the general subject of fuel in the foundry. Films are to be shown and a preliminary list of lectures and lecturers includes the following:—

"The Application of Underfeed Stokers to Foundry Stoves": E. L. Tinsley, Joshua Bigwood & Son, Limited; "The Application of the Semi-Producer Furnace to Foundry Stoves": A. C. Hutt, Solid Smokeless Fuels Federation; "The Application of the Down-jet Furnace to Foundry Stoves": F. B. Karthauser, British Coal Utilisation Research Association; "The Recirculation of Gases in Foundry Stoves": E. Watkinson, A.M.I.Mech.E., Newton, Chambers & Company, Limited; "The Effect of Coke Quality on Cupola Operation": W. J. Driscoll, B.Sc.(Eng.), British Cast Iron Research Association": "The Manufacture of Foundry Coke": R. J. Barritt (Divisional Carbonisation Officer) and G. E. Childs, National Coal Board, South Western Division; "The Testing of Cupola Coke"; "The Hot-blast Cupola": W. J. Driscoll, B.Sc.(Eng.), British Cast Iron Research Association; "Oxygen Enrichment in the Cupola": E. C. Evans, B.Sc.; "The Basic Cupola"; "Can the Carbon Content of Cast Iron Melts be Raised?": Dr. J. G. Pearce, British Cast Iron Research Association; "The Use of Gas in Foundries"; and "The Use of Electricity in Foundries": from the Midlands Electricity Board.

Hot Dip Galvanisers' Association

The Zinc Development Association announce the formation of the Hot Dip Galvanisers' Association, a non-trading body which has been set up to promote the development of existing and new uses of hot-dip galvanised coatings, and to improve galvanising technique. The Council of the Association has elected Mr. F. C. Braby, of Fredk. Braby & Company, Limited, as its first chairman, with Mr. A. H. Thompson, of General Galvanisers, Limited, as deputy chairman. A strong Technical Committee, under the chairmanship of Mr. Thompson, has been appointed to deal with the important programme of scientific work which has been drawn up. The new Association, which will be a member of the Zinc Development Association, will have its offices at the same address, Lincoln House, Turl Street, Oxford (phone, Oxford 48088), to which all inquiries and applications should be addressed. All general galvanisers may apply for membership of the Association.

Oxygen Cutters. The British Oxygen Company, Limited, of London and elsewhere, has used a four-page leaflet to illustrate and describe a new type of oxygen manual cutter known as the Cutogen. It is a neat-looking tool, carrying a one-piece nozzle, and is available in two sizes. The last page sets out in tabular form the recommended operating conditions, giving no fewer than 43 sets of figures, to cover control settings when using oxygen with acetylene, propane and coal-gas. The cover has a very pleasing design.

Book Reviews

The Number, Weight and Fractional Calculator. By William Chadwick. Published by the Technical Press, Limited, Gloucester Road, Kingston Hill, Surrey. Price 30s.

This 850-page book is the best advertisement that could be devised for the metric system, for it contains in all 250,000 calculations, "which will produce, by making only one single addition to each—without having to put down any separate figures—a combination of no fewer than 25,000,000 of calculations." Table No. 1, for instance, tells one at a glance the price of from 1 to 500 and 600—then by 100's up to 1,000, and then 1,000's up to 5,000, and finally 10's of thousands up to 100,000 of articles priced at $\frac{1}{128}$ of a penny or $\frac{3}{32}$d. per dozen or 1½d. per gross. There are tables of which the following is typical: "164 miles," 13s. 8d. each or per cwt.; £13 13s. 4d. per ton, 1.464d. per lb. This particular table wends its way from 1 cwt. to 1,000 tons with everything in between! With the changing times it has been found desirable to incorporate additional rates running from 30s. by stages up to £5 per cwt. or each. Lost in admiration for the toil that must have been expended in its compilation, the reviewer, well realising its extreme usefulness, recommends its purchase by firms whose personnel in their daily tasks have many such calculations to make.

"Mitteilungen aus dem Giesserei-Institute der Technischen Hochschule Aachen." [Collected publications from the Foundry Institute of the Technical High School. Aix la Chapelle.] Edited by Prof. Dr. Ing. E. Piwowarsky. (Seventh edition.)

This book contains 21 publications covering the war period activities of the Aachen Foundry Institute. Some of them are summaries of Papers read at the annual colloquiums held at the college. Others are straight technical contributions and deal with a variety of interesting subjects. Amongst these is a series dealing with cast iron in engineering; then there are Papers on the Damping Capacity of Grey Iron and Steel Castings related to the Cross-sectional Thickness of Aero-engine Piston Rings; The Influence of Corrosion on the Properties of Metals used in Engineering other than Cast Iron; Ageing of Cast Iron; Plastic Deformation of Cast Iron; The Aachen Hot-blast Cupola; Annealing of Steel Castings; Impact Strength of Cast Iron and "Alpex." With but a few exceptions all these Papers are by Piwowarsky, usually in collaboration with a colleague. A very useful contribution to foundry literature has been made by the publication of these collected works, most of which escaped the attention of readers owing to war conditions.

MR. ROBERT A. STAUFFER has been elected Vice-President and Director of Research of National Research Corporation, Cambridge, Massachusetts. Mr. Stauffer, a graduate of Harvard University, has been associated with the company since 1942.

A New Committee

For the first time in history, members of firms supplying foundry materials, in contradistinction to equipment, met together under the ægis of the Foundry Equipment and Supplies Association. Mr. W. E. Aske presided. The majority of the makers of core binders were represented. A resolution was passed and is being sent to the appropriate Government Department asking for the suppression of the State purchase of linseed oil and the like and its return to private enterprise. Throughout the meeting, it was pleasing to note that price policies were rigidly excluded from discussion, and questions of better service to the foundry industry were paramount. Much thought was given to fumes from core binders, and there was a general desire to co-operate with official bodies for suppression of fumes. It was thought to be more a question of accuracy in core-sand mixing, adequate stoving and proper ventilation within the foundries rather than the binders *per se*. If obnoxious materials from this angle were introduced, the makers would, if confirmation were forthcoming, do their best to arrange for their suppression and replacement as was laid down in the case of silicious parting powder. There was a desire expressed to co-operate technically with the American Foundry Supplies Association, and with the national research associations. With increased support from foundry suppliers in general, this new section should make a really worth-while contribution to the general welfare of the foundry industry.

New Catalogues

Grinding Machines. The receipt of a four-page one-piece folder from the Churchill Machine Tool Company, Limited, of Broadheath, Manchester, though it is excellent technical worth, gives the reviewer a further opportunity for expressing his dislike of this form of trade literature. He wonders if this opinion is shared by the issuing house, as a note is printed that it is an extract from a 28-page magazine in course of preparation. Despite what is printed above, the models dealt with are splendidly covered by letterpress and illustration. Foundries using this class of tool will find much to interest them in the wide range of work this new machine can tackle.

Spray Booths. Alfred Bullows & Sons, Limited, of Long Street, Walsall, Staffs, have used a four-page leaflet to enumerate the technical worth of a line of water wash spray booths. By this system no paint can adhere to the walls. Apparently the exhaust system on spray booths can be so severe as materially to reduce the efficiency of the shop heating, so in this design a percentage is sent back into the shop, resulting in a worth-while fuel economy. The pamphlet has been produced in blue with the maker's name picked out in red. This is quite pleasing, but for the middle pages either a lighter shade of blue or a blacker ink could have been used to advantage.

Vitreous Enamels for Aluminium

A development in vitreous-enamel coatings for aluminium, which in comparison with vitreous coatings for steel have the advantage of superior impact and flex resistance, has been announced by E. I. duPont de Nemours & Company,, Inc., Wilmington, U.S.A. The coatings also have excellent resistance to thermal shock and exposure of the base metal does not produce unsightly rust streaks.

At the present time, enamelling only of wrought " 61-S " alloy and of non-porous castings of " 43 " alloy is recommended. However, research is being carried out toward the development of materials and techniques for other alloys and for commercially pure aluminium.

The application of this development was delayed because the enamel developed a spalling defect on exposure to water and weather. On the basis of accelerated spalling tests, however, it is believed that an improved metal pre-treatment has corrected this deficiency. A recommended pre-treatment, to give a surface free from grease, oil and oxide, involves an acid-bath cleaning (or vapour degreasing for bright sheet stock which is not heavily oxidised), followed by a special bath treatment. The treating bath composition is 0.2 per cent. chromium sulphate; 3.8 per cent. caustic soda; 19.0 per cent. potassium chromate, and 77 per cent. water. For " 43 " alloy, the bath is maintained at 104 deg. F. $\pm$ 5 deg. and work is treated for 6 to 8 min. For " 61-S " alloy, the bath is heated to 120 deg. $\pm$ 5 deg. and the work is treated for 3 to 5 min. Prompt washing for the removal of the treating solution is essential.

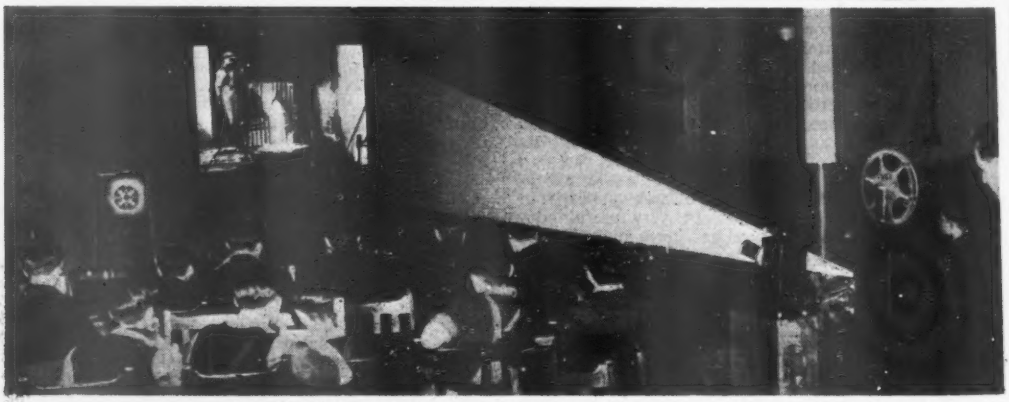
The DuPont concern is supplying coarse frits, pigments and a mill-addition agent to be mixed and wet milled by the enameller. The formulæ give cover coats resistant to the action of mild acids. Ground coats, however, are not acid resistant. Pigmenting of ground coats is not usually recommended as it may cause spalling, although a small amount of pigment is used in the ground coat of whites to improve reflectance in the cover coat.

In general, any surface that can easily be reached with a spray gun can be enamelled. In areas difficult to reach, " slip " usually results with consequent enamel tearing. Corners and edges should be rounded to a radius of not less than $\frac{1}{32}$ in. and thin, non-rigid sections should be enamelled on both sides to prevent warpage. Sand holes in castings are difficult to fill and porosity often results in local spalling. The base aluminium stock should not be anodised or previously treated with strong corrosion-inhibitive agents or cleaners. Enamelling has been successfully carried out on welded seams joined with 590 deg. C. " Airco " welding rod.

In the enamelling procedure, the stock is pre-fired at 520 to 535 deg. C. for a minimum of 5 min. After cooling, a thin ground coat is sprayed on, from 15 to 20 gm. per sq. ft. being recommended. The stock is then given a low-temperature drying to prevent dust pick-up and is again fired at 520 to 535 deg. C. for a minimum of 5 min. After cooling to room temperature, the second coat is applied. One sprayed coat, from 40 to 70 gm. per sq. ft., will usually suffice. If tearing be encountered, two lighter cover coats, separately fired, are suggested. Final firing is carried out under the same conditions as the previous two firings.

The degree of temper of the metal appears to be no factor in enamel properties, although softer tempers are more generally suited to forming operations. The high lead contents of the frits used necessitates care in handling to avoid industrial health hazards and also prevents the application to surfaces which may come into contact with foods. Commercial applications developed thus far include the enamelling of aluminium for shop fronts, advertising displays and bathroom sanitary ware.

*Taken from the " Iron Age."



APPRENTICES ON THE STAFF OF MANLOVE ALLIOTT & COMPANY, NOTTINGHAM, OBVIOUSLY APPRECIATE THE COUNCIL OF IRONFOUNDRY ASSOCIATIONS' FILM SERVICE.

Limitation of Dividends

Further Decisions Announced

Replies to the questionnaire sent out to companies by the Federation of British Industries continue to come in. The F.B.I. had asked whether the companies to which it had sent out its circular letter would agree not to increase their dividends or to exercise a policy of moderation and restraint during the next 12 months. This week we record a further selection of replies.

Greenwood & Batley, Limited, and the Morgan Crucible Company, Limited, are among the companies to have agreed unconditionally to limitation for a further 12 months.

Decisions to adhere to a policy of "moderation and restraint" have been announced by a number of companies. They include:—Kayser, Ellison & Company, Limited ("provided that any small variation in the rate of dividend which might be paid in 1949 were left to the company to fix"); Ambrose Shardlow & Company, Limited; Peglers, Limited; General Electric Company, Limited; Associated Portland Cement Manufacturers, Limited; and Vulcan Foundry, Limited.

The directors of John I. Thornycroft & Company, Limited, in stating their views on dividend policy for the ensuing year, point out that they cannot agree to either of the F.B.I. proposals as the Chancellor has not been able to stabilise hourly wage rates during the last 12 months. On the other hand, they add, the company is prepared to give an undertaking that the rate of dividend distribution during the next 12 months will not be increased over and above the rate which was paid on shareholders' interests for the financial year 1947-48. This legislates for the increased earning capacity due to profits ploughed back into the business in the past year.

Co-operation with the Chancellor

The Chancellor of the Exchequer has received from the Federation of British Industries, the Association of British Chambers of Commerce, and the National Union of Manufacturers, a joint assurance of co-operation for one more year in the policy of dividend limitation.

"I am glad that you have been able to give this assurance, the carrying out of which I shall, of course, follow with keen interest, in the expectation that it will relieve me from the necessity of presenting any legislation to Parliament on this subject matter, at any rate during the present year," said Sir Stafford Cripps on February 24 in a letter to Sir Frederick Bain, president of the F.B.I. The Chancellor wrote to Sir Frederick Bain on January 28 expressing appreciation of the way in which industrial companies had limited their dividends during the past 12 months in fulfilment of their undertaking, and stating: "The policy expressed in the White Paper on personal incomes, costs, and prices, remains as vital to our economic stability as it was at the time the White Paper was issued, and I hope that you will be able to assure me that as regards dividend limitation the co-operation I have had from industry will continue after the expiry of the year to which your letter (of March 12, 1948) related."

The three organisations sent a joint reply, dated February 23. The letter empnasised that industry felt very strongly on the following points:—The recommendation made last year was based on the assumption that Government expenditure would be reduced as an essential part of the disinflationary policy; this has not been achieved. The most powerful single factor in reducing inflationary pressure must be the reduction of public expenditure. Although large and general wage increases have been restrained, during March-December, 1948, higher wage rates have been given to the extent of £1,660,000 a week, affecting nearly 7,000,000 workpeople, and extensive new claims are now being advanced; the effective observance of a policy of restraint by the trade unions must be one of the most important justifications for requesting a similar policy in regard to dividends. Alleviation in corporate taxation would make more effective the provision by industry from its own resources of reserves to meet the heavy liabilities of replacement costs.

The adoption of Stock Exchange values as the basis of compensation for assets taken over by the State, with the addition of dividend limitation, takes an unfair advantage of an entirely unreal factor in the determination of market values of ordinary shares. The aggregate amount of distributed corporate profits after tax is equivalent to less than 4 per cent. of the national income, so any conceivable changes in its level could have only a very slight direct effect on inflation.

Any kind of artificial restriction which leads to rigidity in dividend policy cannot be justified except possibly as a temporary expedient in exceptional circumstances, and its perpetuation would inevitably act as a disincentive to enterprise, efficiency, and the investment of new capital, and would, therefore, be against the national interests.

Sir Stafford Cripps's answer stated that he had taken note of these points, to all of which he would give careful consideration.

NEW OFFICES have been opened at Kent House, Market Place, Oxford Circus, W.1, to house the London sales staff of Rubery, Owen & Company, Limited, motor and structural engineers, of Darlaston, and that of certain other associated companies of the organisation, hitherto contained at various centres in London. The export staff of the organisation will also operate from these headquarters. Mr. S. Gordon Sloan, previously London sales manager of Rubery, Owen & Company, has recently been appointed general sales manager of the company and is now operating at Darlaston. Mr. G. E. Montague, a newcomer to the organisation, succeeds him as London manager.

EXPORT TARGETS FOR 1949

Increase in Iron and Steel

The Board of Trade has announced revised end-1949 export targets for British industry.

The end-1949 target for iron and steel, and manufactures thereof, has been raised from £9.1 million, monthly rate, to £10.5 million. This adjustment is partly on account of increased supplies which are being planned, *e.g.*, for the Colonies, and partly on account of price changes, since export prices in the iron and steel group as a whole increased during 1948 by more than the 5 per cent. allowed for in the preliminary list of targets.

TABLE I.—*End-1949 Targets.*

Products.	£ million (monthly rates).				Percentage of 1938 by volume.	
	Dec., 1948, performance.	End-1948 target.	End-1949, provisional target.†	End-1949, revised target.	End-1948 target.	End-1949, revised target.
RAW MATERIALS—						
Coal	4.16	3.90	6.00	6.00	39	57
Other raw materials	2.34	2.10	2.65	2.65	44	67
Total	6.50	6.00	8.65	8.65	41	60
MANUFACTURES—						
METALS AND METAL PRODUCTS						
Iron and steel manufactures	10.12	8.10	9.1	10.50	111	138
Non-ferrous metals and manufactures thereof	5.34	4.55	4.00	4.00	207	205
Cutlery, implements, instruments, etc.	3.76	3.77	4.27	4.20	213	256
Electrical goods and apparatus	6.49	7.07	7.55	7.50	252	265
Machinery	23.10	22.06	24.48	25.00	206	225
Vehicles, inc. locos, ships, aircraft and rubber tyres	21.66	21.10	21.80	22.13	255	285
Total	70.47	66.65	70.60	73.33	201*	224*
OTHER MANUFACTURES—						
Chemicals, etc.	7.35	8.05	9.00	9.00	184	198
Coke and manufactured fuel	0.70	0.10	0.60	0.60	24	67

* Excluding rubber tyres.
† Announced by the President of the Board of Trade on October 26, 1948.

Iron and Steel Institute Awards

Bessemer Medal for Prof. J. H. Andrew

Prof. J. H. Andrew, of Sheffield University, is to receive the Bessemer gold medal for 1949 of the Iron and Steel Institute.

The Sir Robert Hadfield medal for 1949 is being awarded to Mr. M. W. Thring, head of the physics laboratories of the British Iron and Steel Research Association.

The Williams Prize for 1948 is to go to Mr. J. S. Bryan, fuel engineer at the Normanby Park Works of John Lysaght, Limited, for his Paper, with Mr. J. B. R. Brooke, on "Gaseous and Liquid Fuels in Iron and Steel Works."

The Ablett Prize for 1948 is being awarded to Mr. G. S. Martin, of the Lanarkshire Steel Company, Limited, and Mr. M. Y. Harvey, of Colvilles, Limited, Glengarnock, for their Paper on "The Maintenance of Electrical Machinery in Iron and Steel Works."

AN EXHIBITION AND CONFERENCE on industrial architecture opened on March 3 at 66, Portland Place, London, W.1, under the auspices of the Royal Institute of British Architects. The exhibition will remain open until March 26; the conference was for two days only, March 3 and 4. The technical discussions dealt with structural techniques, heating, ventilation, lighting, and factors affecting working conditions.

Plea for Withdrawal of the Steel Bill

In a statement on Britain's economic position and policy prepared by the Association of British Chambers of Commerce an appeal is made to the Government to withdraw the Iron and Steel Bill. This act, declares the Association, would stimulate in the general public that sense of realism which the Government itself admits is lacking.

The statement also sets out four "fundamental requirements" which should be put into effect. These include the shrewdest appraisal of market prospects in all our trade negotiations with other countries, and determination ultimately to promote conditions in which proper equilibrium and multilateral trading can be restored; allowing producers the finance and incentives to equip themselves for higher productivity and better output, without being driven to the only alternative—that is, reducing the standard of living of their operatives; and the providing of greater incentives for all both to work and to save.

MAJOR C. D. MORRISON, who was until recently chairman of the Blaenavon Company, Limited, states that provisional figures for 1948 would seem to indicate that heavy losses have now been eliminated. This improvement has been achieved by the restriction of the company's operations to the tyre mill, Siemens furnaces and slicing shop.

Personal

MR. F. CRACKNELL has resigned from the board of Specialloid, Limited.

MR. P. G. WALKER has been appointed a director of Ambrose Shardlow & Company, Limited, drop forgers, etc., of Sheffield.

MR. P. R. BETTS has been appointed to the board of A. H. Hunt, Limited, manufacturers of fixed condensers, of Wandsworth, London, S.W.18.

MR. EDGAR FIELDEN has been appointed an additional director of W. H. Dean & Son, Limited, engineers, sheet-metal workers, etc., of Burnley.

SIR WILLIAM REARDON-SMITH has resigned from the chairmanship and directorships of Mountstuart Dry Docks, Limited, and its subsidiary companies.

MR. H. B. HARROP has been appointed works director and general manager of Yates, Haywood & Company & the Rotherham Foundry Company, Effingham Works, Rotherham, where his father, Mr. A. P. Harrop, is managing director.

MR. KENNETH RALPH WALKER has resigned from his position as chairman of Mellor, Bromley & Company, Limited, manufacturers of air-conditioning plant, etc., of Leicester, and MR. THOMAS CHARLES BROMLEY has been appointed to succeed him.

MR. JAMES SMITH has retired as yard manager of the Burntisland Shipbuilding Company, Limited. He joined the company as assistant foreman plater in 1918. He was awarded the O.B.E. for his part in speeding up production during the war. Mr. Smith has received presentations to mark his retirement.

SIR CHARLES WRIGHT is to resign his directorship of Richard Thomas & Baldwins, Limited, as from March 31 next. This was announced at the company's board meeting on March 3, when tributes were paid to Sir Charles for his long and valued services to the iron and steel industry and to the company. Sir Charles Wright is in his 74th year.

MR. H. B. ROBIN ROWELL, chairman of R. & W. Hawthorn, Leslie & Company, Limited, Hebburn-on-Tyne, and MR. HENRY MAIN, managing director of the Caledon Shipbuilding & Engineering Company, Limited, Dundee, were re-elected president and vice-president respectively at the annual meeting of the Shipbuilding Conference in Edinburgh on February 25.

ALDERMAN ARTHUR HYDE, of West Hartlepool, is to receive the Freedom of the Borough. In 1933 he organised a successful opposition to a plan for merging the South Durham Steel & Iron Company, Limited, with Dorman, Long & Company, Limited, on the grounds that the proposed merger would be detrimental to the town. He personally circularised 8,000 shareholders.

SIR JAMES LITHGOW, BT., has relinquished, owing to ill-health, the chairmanship of British Polar Engines, Limited, Glasgow. He will retain his seat on the board. SIR WILFRID AYRE has been appointed chairman and MR. JAMES P. M. FERRIER, deputy chairman. Sir Wilfrid has also joined the board and been appointed chairman of G. M. Hay & Company, Limited, ironfounders, of Glasgow.

New Structure of Staveley Group

In consequence of the Government's decision to exclude the Staveley Coal & Iron Company, Limited, from the Iron and Steel Bill, the directors of the company have issued a statement showing the new structure of the group. Before the introduction of the Bill, the company transferred its interests in those parts of the iron and steel industry which were likely to be nationalised to a new and wholly-owned subsidiary, the Staveley Iron & Chemical Company, Limited. This company is being taken over by the State. The parent company, therefore, is now solely a holding company, its assets consisting of:—

(1) Shareholdings in wholly-owned subsidiaries, *i.e.*, Staveley Iron & Chemical, British Soda Company, Bradley & Foster, Bradley's (Darlaston), Beswick's Lime Works, and Birmingham Chemical Company (of these only the first-named is to be acquired by the State). (2) Claims for compensation under the Coal Nationalisation Act. (3) Interests in the following collieries which are also to be compensated:—Arkwright Coal Company (100 per cent. owned), Doncaster Amalgamated Collieries (40 per cent.), and Newstead Colliery Company (50 per cent.). (4) Investments in Government, etc., securities. (5) Certain small items of land and other fixed assets.

The directors are unable to forecast the amounts to be received as colliery compensation or in respect of the State's acquisition of Staveley Iron & Chemical shares.

Trade with the Netherlands

Trade talks between the Netherlands and the United Kingdom were completed recently. The delegations reviewed fully the prospects for trade both between the United Kingdom and the Netherlands and between the United Kingdom and Indonesia, during the current year. In result it is expected that visible trade between the United Kingdom and the Netherlands should show a considerable advancement over last year at a level of over £60 million each way. There will be an increase in Netherlands exports of manufactured goods as well as a further recovery in supplies of bacon, eggs, and dairy produce to the United Kingdom, and the United Kingdom will supply at least 800,000 tons of coal and additional quantities of tinplate and textile yarns as well as a wide range of staple manufactures.

As regards the United Kingdom's trade with Indonesia, the latter is resuming supplies of copra and palm oil, and her total exports to the United Kingdom, consisting of foodstuffs and raw materials, should amount to £8 million, as compared with imports of manufactured goods from the United Kingdom of some £13 million.

AS FROM FEBRUARY 5, the Administration of Enemy Property Department of the Board of Trade has released from control all patents, trade marks and registered designs belonging to (or held or managed on behalf of) the Italian Government or Italian nationals.

World Production of Iron and Steel

First Half of 1948

Figures showing the production of iron and steel throughout the world in 1947 were given in our issues for December 12, 1947, and August 13, 1948.

The accompanying tables give the corresponding figures, again extracted from the monthly bulletin of the Statistical Office of the United Nations, for the first half of 1948. Monthly averages in 1938 are stated for comparison. All the figures are in thousands of metric tons, Table I referring to pig-iron and ferro-alloys, and Table II to steel ingots and castings.

Figures for Russia and the Russian zone of Germany are again missing from the bulletin.

TABLE I.—*World Production of Pig-iron and Ferro-alloys in the First Half of* 1948 (*Thousands of Metric Tons*).

Countries.	Monthly average, 1938.	1948.						
		Jan.	Feb.	March.	April.	May.	June.	Total.
Australia	79	105	100	107	105	107	91	615
Austria	32.4*	40.8	42.5	44.7	45.9	49.2	55.3	278.4
Belgium	202	306	296	325	334	320	231	1,812
Brazil	10.2	47.5	37.9	41.8	40.5	43.8	44.5	256
Canada	64	161	148	170	168	192	179	1,018
Czechoslovakia ..	110	130	128	140	143	139	136	816
France (*b*)	501	458	480	523	554	566	557	3,138
Germany** ..	1,046†	328	334	375	402	404	427	2,270
Hungary	27.9	25.7	29.2	31.4	32.5	32.9	27.1	178.8
India	131	131	124	134	113	121	121	744
Italy	77.4	16.2	22.6	37.4	39.6	58.2	64.7	238.7
Japan	223	37	37	46	59	63	65	307
Luxemburg ..	129	179	187	209	211	201	222	1,209
Netherlands ..	22.2	26.9	32.4	39.6	35.5	41	40.4	215.8
Poland	74‡	86	85	95	94	94	92	546
South Africa ..	24.5	54.1	53.5	56.2	51.7	44.1	52.7	312.3
Spain	36.9	31.9	37	41.3	45.3	45	42.4	242.9
Sweden (*a*) ..	56.7	56.1	59.7	64.5	76.7	68.6	68.3	393.9
United Kingdom ..	572	683	715	909	736	748	920	4,711
U.S.A. (*b*)	1,589	4,712	4,389	4,554	3,484	4,606	4,527	26,272

* Relates to 1937. ** Bizone and French zone only. † Relates to the bizone in 1936.
‡ Pre-war territory.
(*a*) Excluding ferro-alloys. (*b*) Excluding ferro-alloys made in electric furnaces.

TABLE II.—*World Production of Steel Ingots and Castings in the First Half of* 1948 (*Thousands of Metric Tons*).

Countries.	Monthly average, 1938.	1948.						
		Jan.	Feb.	March.	April.	May.	June.	Total.
Australia	98	104	98	99	107	116	103	627
Austria	54.2*	47	46.8	49.4	49.6	42.4	59.2	294.4
Belgium	190	314	293	327	336	306	231	1,807
Brazil	7.7	67.4	61	59.7	38.7	39.1	42.6	308.5
Canada	98	233	217	259	240	263	235	1,447
Czechoslovakia ..	153	216	205	225	233	220	225	1,324
France	518	551	563	625	650	596	614	3,599
Germany** ..	1,204†	374	385	434	461	424	489	2,567
Hungary	54	59.8	58.5	62.1	66	60.9	63.9	371.2
India	82	115	98	108	97	103	99	620
Italy	194	142	164	183	184	181	194	1,048
Japan	539	80	100	113	122	128	133	676
Luxemburg ..	120	166	170	195	201	183	209	1,124
Mexico	6.1	22	24.5	27.5	28.3	26.3	19.1	147.7
Poland	120‡	155	147	154	164	148	159	927
South Africa ..	25	53	47	51	46	45	47	289
Spain	47.8	34.2	35	39.9	41.7	45.6	44.9	241.3
Sweden	83	103	107	104	119	97	104	634
United Kingdom ..	831	1,142	1,175	1,478	1,195	1,191	1,509	7,690
U.S.A.	2,400	6,779	6,296	6,902	5,641	6,869	6,583	39,070

* Relates to 1937. ** Bizone and French zone only. † Relates to the bizone in 1936.
‡ Pre-war territory.

ON THE GROUNDS of redundancy, 80 of the 500 skilled men employed in the toolroom of Fisher & Ludlow, Limited, metal-pressing manufacturers, etc., of Birmingham, have received a week's notice. The management gives as the reason for the dismissals the completion of the tooling for the Standard Vanguard and the recent decision of the motor-car manufacturers to reduce the number of models. It is reported that the company has offered the toolmakers concerned employment of a less skilled nature.

Changes of Name

The following companies have recently changed their names, the new titles being given in parentheses:—

HUMPHREYS & GLASGOW, LIMITED, engineers, etc., of London, S.W.1 (Humglas Holdings, Limited).

HUMGLAS EXPORTS, LIMITED, engineers, etc., of London, S.W.1. (Humphreys & Glasgow, Limited).

WILFRED L. CRUMBLEHULME (HEATING ENGINEERS BOLTON), LIMITED, Bolton (Wilfred L. Crumblehulme (Bolton), Limited).

RUDD & WEBBERLEY, LIMITED, manufacturers of automatic door closers, etc., of Birmingham (Rudd Engineering Company (Birmingham), Limited).

ALLEN & SIMMONDS (HOLDINGS), LIMITED, formerly Allen & Simmonds (1925), Limited, engineers etc., of Reading (Allen & Simmonds (Auto Culto), Limited).

Recent Wills

HOWITT, KEITH, partner in Higgs Electrical Engineering Company, Newark £16,876

PAIRMAN, W. S., chairman and managing director of Lambhill Ironworks, Limited, Glasgow, chairman of J. H. Carruthers & Company, Limited, pump makers, of Glasgow, and director of other companies £14,159

TATE, COL. S. M., assistant managing director of Tube Investments, Limited, managing director of the Chesterfield Tube Company, Limited, and a director of Howell & Company, Limited, steel manufacturers, of Sheffield, T.I. (Group Services), Limited, Birmingham, and Tubes, Limited, Birmingham £21,767

Parliamentary

Iron and Steel Trading Services

MR. SHARP asked the Minister of Supply if he would give details of the estimated increase from £5,250,000 to £18,200,000 during the present financial year of the cost of the trading services in respect of iron and steel.

In a written answer MR. STRAUSS gave the following details of the original estimates, with the revised estimates in parentheses:—Imported pig-iron and steel, £2,750,000 (£11,000.000); imported scrap, £2,000,000 (£7,000,000); Ministry of Supply agency factories making steel, £500.000 (£200,000), making a total of £5,250,000 (£18.200,000). The original estimate for imported pig-iron, steel and scrap made provision only for the first quarter of the financial year on the basis, subsequently abandoned, that these charges would thereafter cease.

MR. SHARP asked the Minister why the estimated assistance to the iron and steel industry to meet the cost of abnormal freight of iron ore had increased from £2,000,000 to £7,000.000; and on what tonnages of ore were these estimates based.

MR. STRAUSS: "The original estimate provided only for the first three months of the financial year and covered abnormal freight charges on 2,250.000 tons of ore. The revised estimate provides for the whole of the financial year and for a total tonnage of just over 9,000,000 tons."

Fuel Oil Consumption

The PARLIAMENTARY SECRETARY TO THE MINISTRY OF FUEL AND POWER told MR. ERROLL that the available information on the consumption of fuel oil by separate industries covered only those firms which had actually converted from coal to oil burning since the commencement of the coal-oil conversion scheme and which individually used more than 100 tons of coal per annum before converting. Consumption of fuel oil in 1948 totalled 2,110,000 tons, of which the iron and steel industry accounted for 774,000 tons, engineering, shipbuilding, electrical goods and vehicles 363,000 tons, and chemical and allied trades 262,000 tons. In addition, about 1,000,000 tons of fuel oil were consumed by firms which were using fuel oil before the commencement of the coal-oil conversion scheme or used individually less than 100 tons of coal per annum before becoming fuel-oil consumers.

Recent Shipbuilding Orders

The following are among shipbuilding orders recently announced:—

WILLIAM PICKERSGILL & SONS, LIMITED, 4,900-tonner for the Moss Hutchinson Line, Liverpool.

BLYTH DRY DOCKS & SHIPBUILDING COMPANY, LIMITED, 2,900-ton cargo ship for Polish owners.

GREENOCK DOCKYARD COMPANY, LIMITED, a motor tanker of about 16,000 tons dw. for the Empire Transport Company, Limited, London.

Monopolies and Restrictive Practices Inquiry

Iron Castings to be Included

Among the first six industries to be investigated by the Monopolies and Restrictive Practices Commission are rainwater goods, soil goods and miscellaneous builders' castings, made of cast iron. Announcing this in Parliament last Thursday, the President of the Board of Trade said that the investigation was in respect of supply in the United Kingdom.

The Commission will also report to the President of the Board on:—(1) Whether conditions to which the Act applies in fact prevail, and, if so, in what manner and to what extent; (2) the things which are done by the parties concerned as a result of, or for the purpose of, preserving those conditions, and (3) whether the conditions in question or all or any of the things done as aforesaid operate or may be expected to operate against the public interest.

Any person or organisation wishing to offer evidence on the subject matter of these references should write to the Secretary of the Monopolies and Restrictive Practices Commission, 37, Upper Brook Street, London, W.1, for permission to give evidence. It should, however, be clearly understood that applications to give evidence should be forwarded to the Commission only on the subject matter of the references. Any communications suggesting that other cases might be referred to the Commission should be addressed to the Assistant Secretary, Industries and Manufactures Department 1, Board of Trade, Thames House (North), Millbank, London, S.W.1, since the Board of Trade is responsible for deciding which cases should be referred to the Commission for investigation and report.

Standardisation and the Output Drive

Mr. Harold Wilson, President of the Board of Trade, told the British Standards Institute on February 23 that standardisation was among the tools ready to our hands in the great output drive. The figures of the nation's achievements in January and the welcome recovery in our invisible earnings over the past year showed that the nation was making the efforts towards balancing our overseas payments.

"On the home market," he said, "the growing buyer's market for many goods is making it harder and harder to sell goods of inferior quality, but I still get at my office angry letters, often accompanied by purchased evidence, wanting to know what I am going to do about it. Except where the goods are utility and where quality standards can be enforced, my answer must be that it is the industry which manufactures these goods. But there is a real obligation on industry to see that the quality of goods offered our people is as high as it can possibly be."

HEPWORTH & GRANDAGE, LIMITED, Bradford, is opening a new factory for the production of piston rings near Auckland, New Zealand. The factory is to be managed by Mr. J. Cheetham, of Shipley, near Bradford.

News in Brief

SWITCHGEAR & COWANS, LIMITED, Manchester, is issuing the remaining 120,000 5s. shares on a "rights" basis, thus bringing the authorised and issued capital up to £150,000. Terms are one new share at 14s. for every four shares held on February 16.

THE SUM OF $400,000 is to be invested by the Jacobs Manufacturing Company, Connecticut, in Frank Guylee & Son, Limited, engineers and small-tool manufacturers, of Sheffield. The capacity of the Sheffield firm is to be doubled and the dollars will cover expenditure on plant and equipment.

INDUSTRIAL PRODUCTS (SPECO), LIMITED, has been registered as a wholly-owned subsidiary of the Sperry Gyroscope Company, Limited, Brentford, to manufacture and market a new range of oxygen-generating plant. Licence agreements have recently been concluded with Air Products Incorporated, Pennsylvania.

NORTH BRITISH LOCOMOTIVE COMPANY, LIMITED, Glasgow, which, after talks with a visiting Argentine delegation, accepted cancellation of its Argentine order for 20 engines after agreement on recompense for outlay, has now received guarantee of another order in substitution to a capital amount equal to the cancelled order.

AN AGREEMENT has been signed by the Renold & Coventry Chain Company, Limited, Manchester, and McPherson's, Limited, Melbourne, whereby plant for the manufacture of chains and allied products will be set up in Australia by a new company, Renold Chains (Australia), Pty., Limited, in which the Renold & Coventry Chain Company, Limited, will have a controlling interest.

THE FOUNDRY in Service Road, Forfar, has changed hands. The new proprietors are Mr. Thomas Bell and Mr. David C. Lyell, both of Forfar. The foundry was formerly owned by Mr. Walter Nicoll, who died some months ago, and who was predeceased by his partner, Mr. William B. Lowson. As Lowson & Nicoll, they carried on business for many years as agricultural engineers and ironfounders.

THE PROPOSAL to nationalise the shipbuilding industry was described as a silly suggestion by Sir Maurice Denny, chairman of William Denny & Bros., Limited, Dumbarton, at the launch of the twin-screw motor passenger vessel Queen of the Channel, built for the General Steam Navigation Company, Limited. "We manufacture, indeed we largely assemble, an end product, and our wares are about as far removed from basic materials as one can imagine," he said.

THE POZNAN FAIR is being held from April 23 to May 10 and the following are among the British firms which will be exhibiting:—Aveling-Barford, Limited, manufacturers of road machinery, earth-moving equipment, etc., of Grantham; Automatic Telephone & Electric Company, Limited, London, W.C.2; Marconi's Wireless Telegraph Company, Limited, Chelmsford; and R. & J. Dick, Limited, belting manufacturers, of Glasgow. The Board of Trade will be represented at the Fair with an information stand.

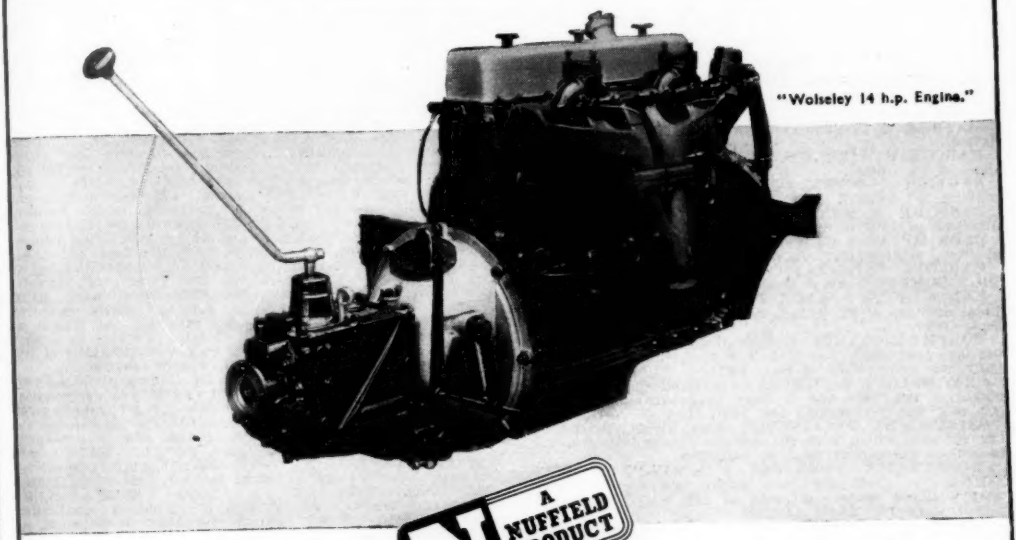
THE MINISTER OF FOOD announces that, following reductions in the costs of the raw materials, the prices of linseed and castor oils (naked, ex works) during the four-week period ending April 2 will be as follow:—Linseed oil, from £185 to £170 per ton; linseed oil foots, from £135 to £120; castor oils, firsts, from £170 to £142; castor oil, seconds, from £166 to £135 per ton. The price of all other unrefined oils and fats and technical animal fats allocated to primary wholesalers and large trade users during this period will remain unchanged.

SPEAKING AT A LUNCHEON of the Hardware Trade Alliance in London, on March 2, Mr. G. S. Summers, a director of John Summers & Sons, Limited, said that the British steel industry to-day could compete favourably with that of any other nation except Australia, where conditions were unique. The relationship between management and men had never been better, and production was on a high level. State control and the inevitable over-centralisation of management would so impair the efficiency of the industry that the cost of steel must increase.

MR. HOWARD NEAL GEORGE, Post Office Box 2904, 212, Ex Hotel Metropolitano, Quito, Ecuador, wishes to contact U.K. manufacturers of road-making machinery, agricultural equipment, ice-making machines, pumps, pipes, barbed wire, etc., with a view to representation on a commission basis. Interested companies should contact Mr. George direct, at the same time notifying the Commercial Relations and Exports Department, Board of Trade, Thames House North, Millbank, London, S.W.1 (reference, C.R.E. (I.B.) 3823/49), of any action taken.

THE INFORMATION that it did not seem a good proposition for the Government at this moment to acquire the site of the former Caird shipyard at Greenock for its development as an industrial estate has been given by Sir Stafford Cripps to Mr. Hector M'Neill, Minister of State. Although a special committee, appointed by Sir Stafford in May, 1948, from the Scottish Board for Industry, with Mr. Charles Murdoch as chairman, to consider and report to the Chancellor on the future utilisation of the 20-acre site, has not yet submitted its report, Sir Stafford has told Mr. M'Neill that its findings are not likely to solve the problem.

ADDRESSING A CROWDED MEETING of members of the Tees-side Chamber of Commerce, at Middlesbrough, on the subject "Why Nationalise Steel?" Mr. Alfred Edwards, M.P., said: "What the Iron and Steel Federation is doing about it is a perfect disgrace." Too many people in the Federation, he said, were waiting to drop into jobs under the Control. "If you have got any guts you will rout out the 'Quislings' in your industrial system. The Federation has got to be made to fight." "Too long," he concluded, "have you taken the view that you must not enter into politics. Politics, however, have entered your realm and you are only going to have one year in which to fight the battle—the most important battle we have ever had to fight."



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STANTON-DALE

REFINED PIG IRON

USED AND RECOMMENDED
FOR ALL HIGH-DUTY
ENGINEERING CASTINGS

THE STANTON IRONWORKS COMPANY LIMITED, Nr. NOTTINGHAM

Company News

(Figures for previous year in brackets.)

D. NAPIER & SON—Dividend of 7½% (same).

CLEAR HOOTERS—Interim dividend of 15% (same).

HEENAN & FROUDE—Interim dividend of 5% (same).

PADLEY & VENABLES—Final dividend of 5%, making 100% (same).

MATHER & PLATT—Final dividend of 7%, making 11% (same).

MARCONI'S WIRELESS TELEGRAPH COMPANY—Dividend of 7% (same).

ENGLISH ELECTRIC COMPANY—Final dividend of 6%, making 10% (same).

RANSOME & MARLES BEARING COMPANY—Interim dividend of 7½% (same).

BEDE METAL & CHEMICAL COMPANY—Final dividend of 12½%, making 18¾% (same).

MARCONI INTERNATIONAL MARINE COMMUNICATION COMPANY—Final dividend of 5%, making 7½% (same).

UNION STEEL CORPORATION (OF SOUTH AFRICA)—Final dividend of 7% (same) and bonus of 2½% (nil), making 12½% (10%).

MORPHY-RICHARDS—Interim dividend of 60%. (For the previous year, 160% was paid in one distribution. The company was made public in May, 1947.)

A. F. BULGIN & COMPANY—Dividend of 27½% for the period of one year and 12 days to January 31 last. The company was incorporated last year.

BAIRDS & DALMELLINGTON—Final dividend of 1s. 7.2d. per 5s. unit, which with the interim dividend is equivalent to 12% on the capital prior to reduction.

CROSTHWAITE FURNACES & SCRIVEN MACHINE TOOLS—Net profit for 1948, £5,601 (£4,728); to general reserve, £1,000 (same); dividend of 10% and bonus of 15% (same); forward, £4,494 (£3,259).

DAVIES & METCALFE—Net profit before tax for 1948, £44,620; to taxation, £24,000; final dividend of 12%, making 15%; written off loose tools, jigs, etc., £2,236; written off patterns, models and drawings, £5,321; general reserve, £6,000; balance forward, £6,123.

NEGRETTI & ZAMBRA—Net profit for the year ended September 30, 1948, £137,001 (£30,372); to preliminary expenses, £2,492 (£4,126); taxation, £89,281 (£28,900); preference dividend, £1,375 (£1,835); final dividend of 10%, making 14%; balance, £32,102 (£1,724).

TROJAN (HOLDINGS)—Net income for the period August 15, 1947, to October 31, 1948, £7,054 (equivalent to gross £12,702); to directors' fees, £717; expenses, £701; income tax recovered, £483; transfer fees, £39; brought in, £2,121; available, £8,279; dividend of 2%; forward, £4,924.

BLAENAVON COMPANY—Loss for 1947, after providing £14,736 for debenture interest, £6,000 for interest on Nuffield Trust Loan and £5,949 for sinking fund, £60,301 (profit £7,412); brought in, £15,678; to amount written off for depreciation of works and property, £21,114; forward debit, £65,737.

CHAS. BAYNES—Trading profit, plus sundry revenue, in 1948, £33,874 (£25,253); to depreciation, £2,193 (£1,500); directors' remuneration, £5,809 (£4,964); auditors' remuneration, £100 (same); tax, £14,542 (£10,250); E.P.T. recovery, £183 (nil); net profit, £11,047 (£8,439); to deferred repairs, £3,500 (nil); final dividend of 35%, making 60% (same); forward, £10,982 (£9,345).

W. R. SYKES INTERLOCKING SIGNAL COMPANY—Trading, etc., profit for the 17 months to October, 2, £19,775 (year to April 30, 1947, £16,249); to depreciation, £3,627 (£2,326); directors' remuneration, £5,178 (£2,940); interest, £667 (£101); audit, £126 (£95); tax, £4,558 (£5,200); deferred repairs, nil (£720); net profit, £5,519 (£4,205); dividend of 9%, £715 (dividend of 6% and bonus of 6%, £955); forward, £21,541 (£16,738).

VULCAN BOILER & GENERAL INSURANCE COMPANY—Interest and dividends received in 1948, £24,753 (£24,026); transferred from revenue account, £135,193 (nil); other provisions not required, £84,201 (nil); to directors' fees, £5,500 (same); tax, £75,000 (£80,000); widows' provident fund, £3,596 (£3,356); general reserve, £220,000 (£93,880); final dividend of 12s. 6d. per share, making 22s. 6d. per share (same); forward, £125,217 (£105,514).

BURNELL & COMPANY—Group trading profit for 1948, £114,114 (£114,963); to depreciation, £13,000 (£12,163); directors' fees, £1,800 (same); auditors' remuneration, £650 (£630); profits tax, £16,000 (£15,750); income tax, £40,590 (£42,250); leaving £72,040 (£72,583); parent company's balance, £31,828 (£35,336); brought in—after £1,500 (£1,000) voted to directors—£64,409 (£57,387); available, £96,237 (£92,723); to general reserve, £10,000 (same); final dividend of 22½%, making 30% (same); forward, £69,423.

CLARKE, CHAPMAN & COMPANY—Trading profit for 1948, £446,870; dividends and interest, £4,125; other income, £421; to depreciation, £32,327; fixed assets replacement reserve, £30,000; general contingencies, £25,000; directors' fees, £3,200; directors' emoluments, £26,923; audit fees, £645; profits tax, £55,000; income tax, £122,051; net profit, £156,270; to staff pensions, £20,000; general reserve, £25,000; research and development, £40,000; preference dividends, £4,890; ordinary dividend of 12½ per cent., £60,000; forward, £54,573 (£48,193).

M. MOLE & SON—Trading balance for 1948, after management remuneration, etc., £31,100 (£49,631); fees, £23 (£66); to taxation, £10,624 (£21,737); directors' remuneration, £3,267 (£4,299); auditors' remuneration, £197 (£260); off property, £70 (£58); pension scheme, £249 (£268); depreciation, £3,000 (same); leaving £13,716 (£20,075); deferred repairs reserve no longer required, £3,733 (nil); tax provision no longer required, £222 (£3,028); available, £28,955 £32,739; to general reserve, £5,000 (£10,000); dividend on increased capital of 20% and bonus of 5% (same); forward, £10,305 (£11,284).

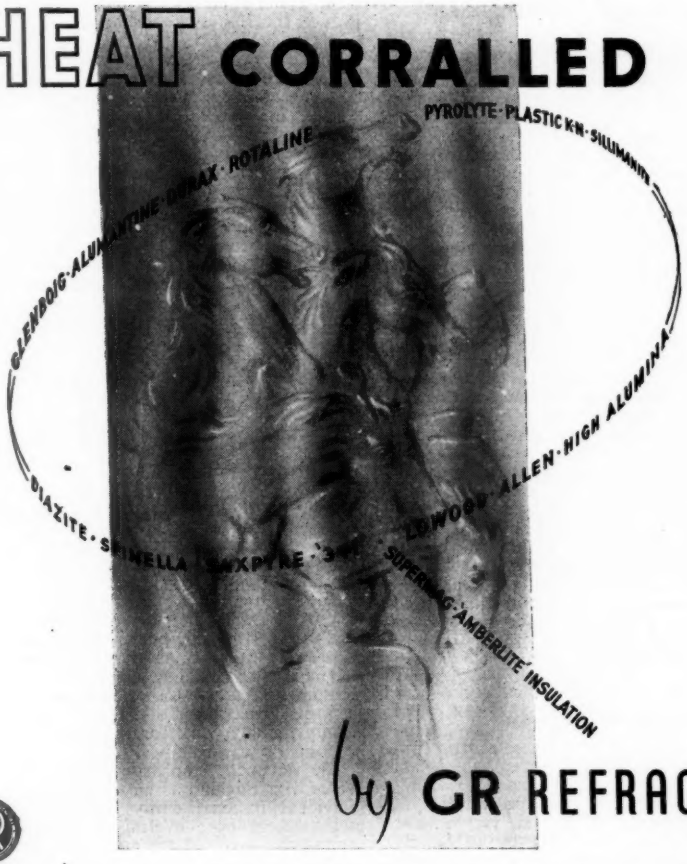
DELTA METAL COMPANY—Group trading profit for 1948, £950,764 (£917,614); interest, £14,697 (£9,152); to depreciation, £53,844 (£76,437); directors' emoluments, £37,297 (same); profit sharing equalisation reserve, £46,850 (£43,619); pension reserve, £5,000 (£16,717); deferred repairs, £50,000 (£46,000); research and development, £50,000 (nil); tax, £529,000 (£503,750); leaving £193,470 (£202,955), of which £95,171 (£10,917) is carried forward in subsidiary accounts, leaving £168,299 (£192,038); brought in, £38,426 (£33,138); available, £206,725 (£225,176); to general reserve, £25,000 (£39,250); dividend equalisation reserve, £25,000 (£15,000); Colonial and export development, nil (£15,000); benefit fund, £5,000 (same); dividend of 12½% and bonus of 25%, both tax free (both same); forward, £39,225.

BRITISH LEAD MILLS—Consolidated trading profit for the year ended October 31, 1948, after charging operating and management expenses (includes reserve no longer required £25,000), £165,904; income from investments, £250; to depreciation, £13,688; directors' emoluments, £17,808; auditors' remuneration, £354; debenture interest of subsidiary (debentures now repaid), £326; leaving £133,978; to taxation, £70,732; subsidiary's profit attributable to period prior to acquisition, appropriated to additional depreciation and to dividend paid to minority shareholders for that period, £1,112; dividends paid and payable to minority shareholders since acquisition, £717; profit attributable to group, £61,417; to general reserve, £22,500; final dividend of 20%, making 32½% (same on lower capital); forward, £31,053 (£14,490).

AVELING-BARFORD—Group trading profit for the year to September 30, 1948, £466,095 (£280,438 for 18 months); dividend from associated company, £5,600 (£1,000); interest from Government securities, £42 (£60); profit on sale of fixed assets, £6,431 (£1,368); to depreciation, £45,990 (£53,627); directors' emoluments, £12,504 (£16,948); pension to retired director, £750 (£1,125); bank interest, £22,663 (£19,923); other expenses, £1,021 (£1,788); leaving £396,240 (£189,455); to taxation, £203,133 (£75,712); net profit of group, £192,107 (£113,743); retained in accounts of subsidiaries, £43,796 (£1,877), leaving net profit of Aveling-Barford, £148,312 (£111,866); reserves of prior years not required, £16,428; to preference dividend, £7,624 (£11,281); final ordinary dividend of 10% (same), which follows an interim dividend of 5%, less tax (5% tax free, and 4%, less tax); general reserve, £120,000 (£25,000); leaving £76,462 (£70,284) forward as per balance-sheet of Aveling-Barford.

AT THE ANNUAL DINNER of Thorncliffe Works Management Association on February 26, Sir Harold West, managing director of Newton Chambers & Company, Sheffield, said the company had a social and recreational scheme for workers, estimated to cost over £30,000, which within two years would make its facilities the finest in the country.

HEAT CORRALLED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Raw Material Markets

Iron and Steel

Blast-furnace outputs are the centre of interest; nowhere is there a surplus. Stocks are low and deliveries are barely adequate for current needs. Makers of light castings would welcome an increase in their rations, but of this there is no prospect at present; indeed, it is not always possible to honour the allocations. Nor are users of hematite and low- and medium-phosphorus irons faring much better; all these grades are wanted in bigger tonnages than are at present obtainable.

Signs of weakness in the Belgian market encourage the hope that it may be possible to obtain more liberal supplies of steel semis from this source. It would certainly be much handier to acquire Belgian billets and sheet bars than to have to ship material from Canada and America, to say nothing about the strain on our dollar resources. However, the British Iron & Steel Corporation, Limited, has negotiated the purchase of substantial tonnages from French steelmakers, and the first consignments have already been distributed. Hence the position at the re-rolling mills is a little easier and outputs tend to improve.

All the heavy rolling mills are busily engaged and order-books for the second period are already well filled. Steel plates are urgently required for a wide variety of purposes and all the mills are working to the limit of their capacity. All classes of railway equipment are in short supply—otherwise a spectacular expansion of exports would be possible. Constructional activity calls for maximum production of joists and sections. Wire and strip mills are working under heavy pressure, and it is still difficult to place orders for black and galvanised sheets even for extended delivery dates.

Non-ferrous Metals

Although virgin-metal prices in America remain firm and unchanged, there is weakness in scrap values, and it is reported that the quotations for secondary aluminium alloy no longer carry the stiff premiums that characterised them recently. In Britain, very similar conditions prevail, for while the Ministry of Supply is maintaining its selling limits for those metals still under control, the free market in scrap is losing ground week by week. This is hardly surprising in view of the poor demand and the generous supply of old metals, the bulk of which still comes from Ministry of Supply depots. The Government's stocks at the end of January had declined to about 38,000 tons—the previous total was for the position at October 31, when the authorities held some 45,000 tons of various types. Some interest has been aroused through the reappearance in the stock list of an item covering Q.F. brass shell cases, which have been omitted since the conversion contracts were arranged with Canada and the United States. The Canadian arrangement came to an end some time ago, but the American contract remained, mainly, it was supposed, because the authorities were experiencing difficulty in finding all the material required for shipment to the refineries. It must now be presumed that the last ton has crossed the Atlantic and, further, that no renewal is contemplated.

The British Bureau of Non-ferrous Metal Statistics has issued figures in respect of January, which show that consumption during the month was well maintained. In comparison with December, there was an advance of about 2,100 tons in the January usage total, practically all of which was in scrap, for virgin copper usage at 28,504 tons was up by only 178 tons. The secondary figure was 15,211 tons, which compares with 13,270 tons in December. Stocks of copper in the United Kingdom at the end of January were 115,349 tons, about 5,000 tons less than at December 31. Lead stocks were up from 19,960 tons at December 31 to 23,449 tons at the end of January, a satisfactory improvement, but hardly good enough against the background of a consumption rate of about 28,000 tons monthly. There is, at present, a very considerable tonnage of secondary lead available in this country, and the price of scrap to-day is no more than about £90 per ton. Lead scrap, in coming down to £90, or £33 below virgin lead, is following the course set by brass and copper. Heavy copper scrap is now listed at from £95 to £100 per ton, delivered users' works.

Tory Policy for Wales

In a statement by the Conservative Party on its policy for Wales and Monmouthshire, published on February 28, in a booklet containing both English and Welsh text, one of the principal features is the promotion of a stable and diversified system of industry. This industrial policy points out the necessity of securing a wide range of industries founded upon mining, iron, and steel building up a complex of heavy and medium industries. Care should be taken it is added, that the development of light industries, which should mainly provide work for the disabled and unfit, does not outstrip the rest.

The statement emphasises that both the identity of Wales with England as an economic unit and her own individual national entity must be recognised. The establishment of a Welsh Office is rejected on the ground that many of the most important administrative matters would be left outside its scope. Under the Conservative proposal a Cabinet Minister would be answerable in Parliament for the Government's policy in its relation to Wales.

MR. A. J. K. HONEYMAN, who is to be chief metallurgist of the Steel Division of the Steel Company of Wales, Limited, gained his early industrial experience with the Clyde Alloy Steel Company, Limited, and at the Dalzell Works of Colvilles, Limited, Motherwell, being appointed test manager for that company in 1928. In 1938 he was appointed assistant chief metallurgist and in 1947, deputy chief metallurgist. Mr. Honeyman has published a number of technical Papers, while he serves on several committees of the British Standards Institution and the British Iron and Steel Research Association.